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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,933	12/03/2003	Wen-Kun Yang	25857	4487

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EXAMINER

ZARNEKE, DAVID A

ART UNIT PAPER NUMBER

2891

DATE MAILED: 12/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/725,933

Applicant(s)

YANG ET AL.

Examiner

David A. Zarneke

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30,31 and 34-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30,31 and 34-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 11/14/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 11/14/06, with respect to the rejection of the claims have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made below.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 30, 31 and 34-41 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gengel, US Patent 6,417,025.

Gengel (figure 4A-4N) teaches a fan out type package structure, comprising:

- an isolating base [406];
- a die [410] adhered to said isolating base;
- a first dielectric layer [404] formed on said isolating base and filled in a space except said first die on said isolating base;
- a second dielectric layer [412] formed on said first dielectric layer and said first die, and said second dielectric layer having first openings [414] on first pads of said first die;
- a first contact conductive layer [416] formed on said first openings to electrically coupling with said first pads, respectively;

a first conductive lines [416] formed on said second dielectric layer and corresponding said first contact conductive layer, and said first conductive lines being extended out from corresponding said first contact conductive layer to corresponding first end points, wherein said corresponding first end points are inside a surface of said second dielectric layer;

a first isolation layer [420] formed on said first conductive lines and said second dielectric layer, and said first isolation layer having second openings [422] on said first conductive lines; and

solder balls [424] welded on said second openings and electrical coupling with said first conductive lines, respectively.

In the alternative, the claims are rejected under 103 if the limitations of the first contact conductive layer and the first conductive lines are both presumed to be separate layers. While Gengel fails to teach the use of two separate layers, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to not patentably distinguish the processes [Ex parte Rubin 128 USPQ 440 (PTOBdPatApp 1959)]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the two separate steps in the invention of Gengel because one can better control the flow of the conductive material into the opening when performed separately.

Regarding claim 31, Gengel teaches the surfaces of said first dielectric layer and said first die are at same level (figure 4N).

With respect to claim 34, while Gengel fails to teach the said first die is formed by sawing a processed base, this is a product-by-process limitation. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Further, acquiring a die from a process that saws the die from a base is conventionally known in the art.

As to claim 35, while Gengel fails to teach said processed base is back lapped to get a thickness of said processed base around 50-300 um, back-lapping is a product-by-process limitation. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore, all this claim requires is the die to be around 50-300 um thick. As seen in the drawings, the first dielectric layer [404] is the same height as the die. Gengel teaches the first dielectric layer [404] is about 50 microns thick (4, 10+). Therefore, the die must be about 50 microns thick. Further, it would have been obvious to one ordinary skill in the art at the time of the invention to optimize the thickness of the die (MPEP 2144.05).

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In re claim 36, Gengel teaches the first dielectric layer is made of silicon dioxide (4, 9+) and said second dielectric layer comprise UV curing type material, heat curing type material, and the combination thereof (5, 40+). The use of a UV curing type material, heat curing type material, and the combination thereof as the first dielectric layer as opposed to silicon dioxide would have been obvious to one of ordinary skill in the art because they are equivalent materials known to be used as a dielectric in the forming of an interconnect. The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Regarding claim 37, Gengel teaches said first contact conductive layer comprises Ti, Cu, and the combination thereof (5, 63+).

With respect to claim 38, Gengel teaches said first conductive lines comprise Ni, Cu, Au, and the combination thereof (5, 63+).

As to claim 39, while Gengel, which teaches a thermally conductive (4, 9+ & 18+) isolating base, fails to teach a material of said isolating base is glass, silicon, ceramic, or crystal material, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an isolating base made of glass, silicon, ceramic, or crystal material because all of these materials are commonly known materials used as an isolation base. The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak

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16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

In re claim 40, while Gengel fails to teach an epoxy layer formed on back surface of the base, it would have been obvious to one of ordinary skill in the art at the time of the invention to form an epoxy layer on the back of the base because it is conventionally known in the art. A skilled artisan would form an epoxy layer on the back of the base in order to protect the base during the dicing process. The use of conventional materials to perform there known functions in a conventional process is obvious (MPEP 2144.07).

Regarding claim 41, while Gengel teaches the isolating layer is made of silicon dioxide, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an epoxy, resin or combinations thereof as the isolating layer in the invention of Gengel because they are equivalent materials known to skilled artisans to be used in this manner. The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Conclusion

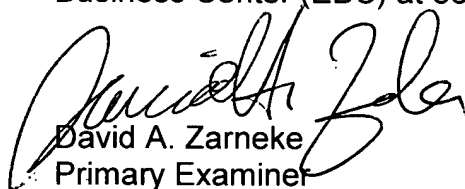
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited but not relied upon teach the state of the art.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (571)-272-1937. The examiner can normally be reached on M-Th 7:30 AM-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Baumeister can be reached on (571)-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David A. Zarneke
Primary Examiner
December 2, 2006